

XXV.—On some Recent and Fossil Foraminifera dredged up in the English Channel. By Prof. T. RUPERT JONES, F.R.S., F.G.S., &c., and W. K. PARKER, F.R.S., F.L.S.

I. IN 1857, Dr. S. P. Woodward favoured us with a sample of sea-sand dredged by Mr. M'Andrew and himself from 60 fathoms, 40 miles south of the Scilly Islands. He also gave us a sorting of fossil Nummulites taken from that sand. These are mineralized with carbonate of lime, and are small—the largest not three eighths of an inch in diameter. They are dense, and mostly smooth and even polished, in some cases much worn; and one has a small recent *Spirorbis* attached.

These fossils are:—

Nummulina Ramondi, *Defr.*  
— Rouaulti, *D'Arch. & Haime.*

The recent Foraminifera from the same sand we found to be:—

Miliola (Quinqueloculina) seminulum ( <i>Lin.</i> ). Young.	Polymorphina myristiformis, <i>Williamson.</i>
— — Ferussacii, <i>D'Orb.</i>	— costata, <i>Egger.</i>
Young.	Uvigerina angulosa, <i>Will.</i>
— (Spiroloculina) planulata, <i>Lam.</i>	Cassidulina oblonga, <i>Reuss.</i>
Trochammina squamata, <i>P. &amp; J.</i>	Textularia aciculata, <i>D'Orb.</i> Mostly aculeate on the edges.
Lituola globigeriniformis, <i>P. &amp; J.</i>	— sagittula, <i>Defr.</i> Common.
Lagena sulcata, <i>W. &amp; J.</i>	— agglutinans, <i>D'Orb.</i> Large.
— squamosa, <i>Montagu.</i>	Spirillina vivipara ( <i>Ehr.</i> ).
— marginata, <i>Mont.</i>	Patellina corrugata, <i>Will.</i>
Nodosaria obliquestriata (both Dentaline and Marginuline), <i>Reuss.</i>	Pulvinulina auricula ( <i>F. &amp; M.</i> ) Large.
Vaginulina legumen ( <i>Lin.</i> ). Smooth.	— pulchella ( <i>D'Orb.</i> ).
Dentalina communis, <i>D'Orb.</i>	Discorbina globularis ( <i>D'Orb.</i> ) Common.
Marginulina raphanus ( <i>Lin.</i> ) Short.	— rosacea ( <i>D'Orb.</i> ) Feeble and more conical than usual; together with intermediate forms.
Cristellaria cymba, <i>D'Orb.</i>	Rotalia Beccarii ( <i>Lin.</i> ).
— rotulata ( <i>Lam.</i> ).	Nonionina striato-punctata ( <i>F. &amp; M.</i> ).
Polymorphina lactea ( <i>W. &amp; J.</i> ).	
— horrida, <i>Reuss.</i>	
— compressa, <i>D'Orb.</i>	

From the stomach of a *Dentalium* dredged up, at the same time, off Vigo:—

Nonionina umbilicatulata (*Montagu*), varying towards *N. scapha* (*F. & M.*).  
Small Bivalves, whitened in blotches and along sinuous lines.

II. At the same time we received also from Dr. S. P. Woodward a sample of sand dredged by Mr. M'Andrew and

himself at 70 fathoms, 50 miles S.W. of Ushant. It contained the following recent Foraminifera :—

*Miliola* (*Biloculina*) *bulloides*,  
*D'Orb.*

— (—) *depressa*, *D'Orb.*

— (*Triloculina*) *reticulata*, *D'Orb.*

— (*Quinqueloculina*) *pulchella*,  
*D'Orb.*

— (—) *Ferussacii*, *D'Orb.*

— (*Spiroloculina*) *planulata*,  
(*Lam.*).

*Lituola canariensis* (*D'Orb.*).

*Lagena marginata*, *Montagu.*

— *squamosa*, *Mont.*

*Dentalina communis*, *D'Orb.*

*Nodosaria obliquistriata* (both *Dentalina* and *Marginulina*), *Reuss.*

*Vaginulina legumen* (*Linn.*).

Smooth.

*Cristellaria crepidula* (*F. & M.*).

Rather thick.

— *cultrata* (*De Montf.*).

*Polymorphina lactea* (*W. & J.*).

— *horrida*, *Reuss.*

— *oblonga*, *Williamson.*

*Uvigerina angulosa*, *Will.*

*Cassidulina oblonga*, *Reuss.*

— *laevigata*, *D'Orb.*

*Textularia aciculata*, *D'Orb.* Mostly  
aculeate on the edges.

— *agglutinans*, *D'Orb.*

— *sagittula*, *DeFr.* Common.

*Orbulina universa*, *D'Orb.*

*Globigerina bulloides*, *D'Orb.*

*Spirillina vivipara* (*Ehr.*) = *perforata*,  
*Schultze.*

*Planorbulina farcta* (*F. & M.*)  
Young.

— *tuberosa* (*F. & M.*).

— (*Truncatulina*) *lobatula* (*W. & J.*). Large.

*Pulvinulina auricula* (*F. & M.*).

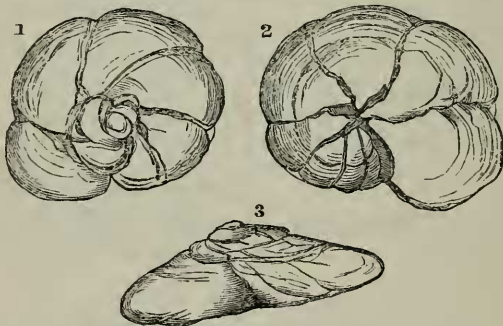
— *repanda* (*F. & M.*).

— *pulchella* (*D'Orb.*).

— *sacculata*, *P. & J.*, nov. spec.

*Discorbina globularis* (*D'Orb.*)  
Common.

The *Pulvinulina sacculata* above named (figs. 1–3) is a well marked form already figured by Soldani, 'Testaceographia' &c. 1789, vol. i. p. 56, pl. 37. fig. B (Vas 162). It has a finely tubuliferous and clear shell, subconical, many-chambered, smooth and neatly limbate above on the low spire



*Pulvinulina sacculata*, *P. & J.*

1. Upper or spiral surface. 2. Lower or umbilical face. 3. Edge.

(fig. 1), and characterized below by about five bladder-like supernumerary umbilical chamberlets, the last showing the relatively large mouth, and all of them defined around by the more solid marginal portion of the shell (fig. 2).

III. In 1859, Prof. D. T. Ansted gave us a sample of the "large deposit, chiefly of Foraminifers in a mud, in deepish water, and rather widely spread," off the coast of Guernsey\*, and probably the same as that alluded to by J. Gwyn Jeffreys, Esq., in the 'Report of the British Association for 1865,' Transactions of Sections, p. 183, as a bed with both recent and fossil shells, at from 12 to 20 fathoms, among the Channel Islands. Mr. J. Gwyn Jeffreys also kindly submitted some of this sea-bed to our examination.

Prof. Ansted's sample contained numerous fossilized Nummulites and other Foraminifera. The latter are all dense by mineralization; and most of the Nummulites also are mineralized by carbonate of lime (though not always solid), and are much worn, or, at least, smoothed and even polished. The list is as follows:—

Nummulina Prestwichiana, Jones.		one specimen of a still thicker
— Ramondi, Defr.		<i>Truncatulina</i> .
— Rouaulti, D'Arch. & Haime.		Alveolina Boscii (Defr.). Two
Discorbina trochidiformis, Lam.		specimens.
Planorbulina (Truncatulina) fæcta, var. Dutemplei (D'Orb.). And		

In his Notice of the occurrence of certain Fossil Shells in the Sea-bed adjoining the Channel Isles, 1865, it is stated:—"In the course of his dredging-explorations this year among the Channel Isles, Mr. J. Gwyn Jeffreys found shells of species some of which are extinct, and one is not known to inhabit at the present the North Atlantic. They were taken with living Mollusca at depths varying from 12 to 20 fathoms, and in different parts of the sea-bed. The specimens in question had the same appearance as dead shells of recent species; one of them was in a most perfect state of preservation, and evidently had not been rolled or transported to any distance from its original place of habitation. They consisted of *Potamidés tricarínatus*, Lam., and *P. cinctus*, Lam. (both Eocene fossils), a species of *Terebratula* (or *Terebratulina*) which Mr. Davidson referred with doubt to *T. squamulosa* of Baudon (from the Calcaire grossier), and *Discorbina trochidiformis* of Lamarck is also an Eocene fossil, but larger than specimens from the Bracklesham beds. No Tertiary deposit

\* In 'The Channel Islands' by D. T. Ansted and R. G. Latham (8vo, London, 1862), at p. 295, it is stated that Dr. Lukis dredged some specimens off the south-eastern extremity of Guernsey, and these are referred to as having been probably drifted from the coast of France. "As there must be a strong and deep current [says Prof. Ansted, in a letter] setting every tide up-Channel and rounding the island of Guernsey, it is not at all unlikely that they may have come from the water off Ushant."

has been noticed in any part of the Channel Isles; but the discovery of the above-mentioned fossils in the adjoining seabed, occupying an intermediate position, would seem to connect this district with Hampshire and Normandy, and to show the great extent of the Eocene basin or area which formerly existed. Another species obtained by the same dredgings, near Jersey, was *Cerithium vulgatum*, Bruguière." As this estuarine species still exists in the Mediterranean region, Mr. Jeffreys thinks that it may have lived in the Jersey area before the coasts were so much submerged as they are now.

IV. It would be of much interest to know the real place of origin of the fossil *Nummulinae* above mentioned. They are of Eocene age; but whether washed about at or near any existing patches of Tertiary beds, or drifted some way from their original place of deposit, is not clear. The *Discorbinae*, *Planorbulinae*, and *Alveolinae* are solid and very much rolled. Some of the more solid *Nummulinae* (chiefly *N. Rouaulti*) are also much worn.

Neither *N. Ramondi* nor *N. Rouaulti* belong to the Tertiaries of N.W. Europe. They occur in the Pyrenean and Gascon region, though *N. Rouaulti* is known to reach as far north as Dax, near Bordeaux, if not, indeed, as far as the Soissonais. The other fossils, however, of the Dredgings under notice, except *Nummulina Prestwichiana*, are found plentifully in the Paris Basin and the Tertiaries of Normandy; and they abound, together with *N. Prestwichiana*, in the "Bracklesham beds" of Hampshire and the Isle of Wight. This last form was described in the 'Quart. Journ. Geol. Soc. Lond.' vol. xviii. pp. 93 & 94, as *N. planulata*, var. *Prestwichiana*, and possibly may be essentially the same as *N. planulata*, var. *a. minor*, D'A. & H., which occurs at Jette, in Belgium.

Since we look upon *N. Ramondi* also as a variety (thick) of *N. planulata*, and as, according to our view of the nature of Nummulites\*, *N. Rouaulti* is not far removed from the same subtype, the association of the three *Nummulinae* above mentioned is not strange in a natural-history point of view, although they have not yet been met with elsewhere in company with each other and with the other fossil Foraminifera enumerated above.

Fossil Nummulites (*N. levigata*?) have been dredged up in the English Channel by Mr. Godwin-Austen†, and by M. Ernest Vanden Broeck‡ on the coast of France and Belgium;

\* Ann. & Mag. Nat. Hist. ser. 3, vol. v. p. 106 &c., and vol. viii. p. 230 &c.

† *In literis.*

‡ *In literis.*

the latter has also found Nummulites (including probably *N. Ramondi*) in the sea-sand off Gascony. Indeed our friend M. E. Vanden Broeck suggests the question, Can the Gulf-stream have had force enough to drift the fossil Nummulites from the Bay of Gascony to the English Channel?\*

So many of the aforesaid fossil Foraminifera, dredged up in the Channel, being near their well-known formations in England and France, and one of the *Nummulinæ* (*N. Prestwichiana*) occurring in Hampshire, if not also in Belgium, we need not look for a distant origin for them; and their strata may be, or may lately have been, in place between France and England. Further, though several of the specimens of *N. Ramondi* and *N. Rouaulti* are greatly worn, many show no sign of having travelled very far, and those that have been worn down have not suffered more than the *Discorbinae* and others.

At all events, the facts are suggestive of further research.

PS. In a letter dated March 7, 1876, Prof. Ansted favours us with his opinion that "it is not impossible or very unlikely that Foraminifera should be drifted from the Bay of Biscay to the Channel Islands. Whatever lives in the southern part of the former sea may be drifted westward by the return storm-waves, reflected from the French coast (and making the notoriously bad and broken seas met with in crossing the Bay) much westward of the line up which comes a drift from the south, caused by the return or back current of the Gulf-stream, when it gets well to the south. Any thing like Foraminifera would then be caught by the tide-wave and carried up-channel."

XXVI.—Notes on some *Heteromerous Coleoptera* belonging to the true *Tenebrionidæ*. By CHARLES O. WATERHOUSE.

HAVING recently had occasion to refer to one of Motschulsky's papers on *Tenebrionidæ* published since his death in the 'Bulletin de Moscou' (1873, p. 23), I have thought that a few remarks on it might be useful. At the same time, I must emphatically protest against the publication of this author's papers, which, it is clear from internal evidence, were written

\* M. E. Vanden Broeck remarks that M. A. Lafont, in his paper on the Fauna of the Arcachon Basin, says that *Spirula Peronii* is sometimes found on the coast, evidently brought by the currents from the south ('Actes Soc. Linn. Bordeaux,' ser. 3, vol. vi. 1868).